REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Claims 1-3, 6-8 and 11-13 are currently being amended.

This amendment changes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 1-13 are now pending in this application, of which claim 6-13 are withdrawn from consideration.

Rejection under 35 U.S.C. § 103

Claims 1-5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,713,216 to Higashi et al. (hereafter "Higashi"). Applicants respectfully traverse this rejection for at least the following reasons.

Claim 1, as amended, recites an aluminum alloy consisting essentially of Zn, Mg, Er as the main alloying elements, the remainder of Al, and incidental impurities. Although Higashi discloses a number of rare elements, including Er, that may be added to its alloy, Higashi discloses preferably that one or two elements selected from Y, La, Ce, Pr, Nd and Sm are used (col. 2, lines 36-37), and does not provide any alloy examples with Er as the rare earth element, much less only Er. Thus, Higashi fails to disclose an aluminum alloy consisting essentially of Zn, Mg, Er as the main alloying elements, the remainder of Al.

Moreover, as disclosed in the present application on pages 4-5, bridging paragraph, the addition of Er results in an aluminum alloy with significantly refined grain microstructure and a dramatically increased strength. By contrast, Higashi fails to suggest adding Er to an aluminum alloy including Zn and Mg to improve the strength of the alloy.

The Office Action states with respect to Higashi: "Higashi teaches an Al-Zn-Mg alloy with added rare earth such as Er (column 2 line 32), which is effective to enhance the strength

of said alloy." Higashi, however, fails to disclose that Er has an effect of improving the strength of an Al-Zn-Mg alloy.

Higashi discloses that zinc or magnesium, not Er, or any other rare earth element, is added to aluminum to increase the strength of the alloy. Specifically, Higashi discloses "zinc is added to increase the strength of aluminum alloys" (col. 2, lines 9-10) and "Magnesium is also effective to increase the strength of aluminum alloys" (col. 2, lines 17-18). Higashi discloses that the rare earth elements are added to increase and stabilize the resistance to stress and corrosion (col. 2, lines 54-56), where the stress and corrosion appear to be due to the addition of zinc to the alloy (col. 1, lines 27-29). Additionally, the hot extrusion and malleability of the alloy are improved by the addition of rare earth elements (col. 2, lines 56-57), where the malleability is impaired by the addition of an excessive amount of magnesium (col. 1, lines 30-32). Thus, Higashi suggests that the rare earth elements are necessary to compensate for the addition of the zinc and magnesium to improve the stress, corrosion and malleability, not to improve the strength of the alloy. Higashi discloses improving the strength of the Al-Zn-Mg alloy only by the addition of Zn and Mg, not Er or any other rare earth element.

Moreover, one skilled in the art, having reviewed Higashi, would not look to the addition of Er as a way to increase the strength of an aluminum alloy. Higashi does disclose the addition of rare earth elements with regard to the strength of its aluminum alloy. Higashi, however, discloses that the rare earth element decreases the strength of the alloy. Specifically, Higashi discloses that if rare earth elements are added excessively, crystallization occurs in a rather rough state in the alloy, thereby reducing the strength of the alloy (See col. 2 lines 46-50). In this sense Higashi teaches away from adding Er, or any rare earth elements, to improve the strength of the alloy.

Dependent claim 2 depends from claim 1, and is thus allowable for at least the same reasons. Moreover, claim 2 recites "wherein the Er is comprised of about 0.1~0.7 Wt %." As suggested in the present specification in table 3 on page 14, and as shown in Figures 2 and 3, a minor addition of Er (from 0.1% to 0.7%) can produce a large increase in strength of the Al-Zn-Mg alloy, and a much refined microstructure as shown by Figure 6. As discussed above,

Higashi does not suggest that rare earth elements, such as Er, have the effect of improving the strength of an Al-Zn-Mg alloy, much less the relatively minor amount of Er as recited in claim 2. Having reviewed the Higashi reference, one skilled in the art would look to Zn or Mg to improve the strength of an aluminum alloys, not relatively small amounts of Er, or any other rare earth element.

Moreover, with respect to claim 2, Higashi fails to suggest that Er may be used in relatively small amounts, 0.1-0.7 Wt% to improve the properties of the aluminum. Higashi suggests that the addition of rather larger amounts of rare earth elements, preferably 2.0-7.0%, more preferably 4.0-6.0% (col. 2, lines 51-52), specifically at least 2.1% (table 1), should be added to the aluminum alloy. Higashi discloses that the addition of rare earth elements lower than 0.5% would result in total loss of the desired effect (col. 2, line 44-46). Thus, Higashi would teach away from the addition of relatively small amounts of Er, even lower than 0.5 %, such as recited in claim 2.

The aluminum alloy as recited in claim 2 is also better adapted for existing aluminum industries than that of Higashi. As indicated by Higashi, the AA 7XXX alloys are Al-Zn-Mg alloys (col. 1, lines 16-20), which are widely used for structural purposes. Higashi discloses the modification of the AA 7000 alloys by addition of relatively high amounts of rare earth elements, preferably 4.0-6.0%, which may substantially change the existing composition of the AA 7XXX alloys and their processing systems. By contrast, the alloy of claim 2 includes a relatively small amount, e.g., about 0.1-0.7 Wt %, of Er. Therefore the alloy of claim 2 could be embodied in existing AA 7XXX alloys, with a very small change to the alloy, and is thus much more compatible to existing aluminum industries.

The remaining dependent claims under consideration, 3-5, are allowable for at least the same reasons as claim 2, from which they ultimately depend, as well as for further patentable features recited therein.

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is believed that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date April 14, 2005 By _____

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